

METAMORPHIC ROCKS.

The rocks composing the terrestrial crust have not always remained in their original state. They have frequently undergone changes which have altogether modified their properties, physical and chemical.

When they present these characteristics, we term them *Metamorphic Rocks*. The phenomena which belong to this subject are at once important and new, and have lately much attracted the attention of geologists. We shall best enlighten our readers on the metamorphism of rocks, if we treat of it under the heads of *special* and *general* metamorphism.

When a mass of eruptive rock penetrates the terrestrial crust it subjects the rocks through which it passes to a special metamorphism—to the effects of *heat* produced by *contact*. Such effects may almost always be observed near the margin of masses of eruptive rock, and they are attributable either to the communicated heat of the eruptive rock itself, or to the disengagement of gases, of steam, or of mineral and thermal waters, which have accompanied its eruption. The effects vary not only with the rock ejected, but even with the nature of the rock surrounding it.

In the case of volcanic lava ejected in a molten state, for instance, the modifications it effects on the surrounding rock are very characteristic. Its structure becomes prismatic, full of cracks, often cellular and scoriaceous. Wood and other combustibles touched by the lava are consumed or partially carbonised. Limestone assumes a granular and crystalline texture. Siliceous rocks are transformed, not only into quartz like glass, but they also combine with various bases, and yield vitreous and cellular silicates. It is nearly the same with argillaceous rocks, which adhere together, and frequently take the colour of red bricks.

The surrounding rock is frequently impregnated with specular iron-ore, and penetrated with hydrochloric or sulphuric acid, and by divers salts formed from these acids.

At a certain distance from the place of contact with the lava, the action of water aided by heat produces silica, carbonate of lime, aragonite, zeolite, and various other minerals.

From immediate contact with the lava, then, the metamorphic rocks denote the action of a very strong heat. They bear evident traces of calcination, of softening, and even of fusion. When they present themselves as hydrosilicates and carbonates, the silica and